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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/256,346	02/24/1999	KEN-ICHI TAKATORI	Q053397	9700

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WASHINGTON, DC 200377060

EXAMINER

NELSON, ALECIA DIANE

ART UNIT	PAPER NUMBER
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2675

23

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/256,346

Applicant(s)

TAKATORI ET AL.

Examiner

Alecia D. Nelson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2003.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 16-19 is/are allowed.
6) ☒ Claim(s) 1-4 and 7-15 is/are rejected.
7) ☒ Claim(s) 5,6,8/5/3/2/1,9/6/5/3/2/1 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.22.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The references listed in the Information Disclosure Statement submitted on 5/17/99 and 09/17/03 have been made of record and has been considered by the examiner (see attached PTO-1449).

The references listed in the information disclosure statement filed 9/6/01 have been recited on attached PTO-892. It appears as if the references were considered as being attached to the office action mailed 12/27/01. The references have been placed in the application file.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claims 14** is rejected under 35 U.S. C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. **Claim 14** recites "a liquid crystal display apparatus as defined in claim 10...for driving a liquid crystal display element according to any one of claims 10-12." It is indefinite as to which claim is the base claim and fails to particularly point out and distinctly claim the subject matter of the claim, i.e. multiple

dependent **claim 14**, depends on multiple dependent **claim 12**. Appropriate correction is required

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. ***Claims 1-4, 8/1, 8/2/1, 8/3/2/1, and 8/4/3/2/1*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mihara (JP Patent No. 405303076) in view of Okada et al. (U.S. Patent No. 4,800,382).

With reference to **claim 1**, Mihara teaches a method for driving a liquid crystal display device comprising scanning successively a plurality of scan lines in a first field of a frame for display and scanning successively the scan lines in a second field of the frame for display in an order reverse to that in the first field (see page 4, paragraphs 27-28, of computer translation). It can be seen in figure 4 that the first field (left half) scans lines S1-Sn successively and in the second field (right half) scans in a reverse direction from lines Sn-S1.

Mihara fails to specifically teach simultaneously resetting the scan lines in the first field after the scan lines are successively scanned in the first and second field.

Okada teaches a method for driving a liquid crystal display device whereby the states written in the preceding field, or frame, are erased into "white" state (see column 6, lines 24-30). With further reference to an alternate embodiment it is taught that the erasure step (C1) is simultaneously applied to the scanning lines (see column 5, lines 59-63)

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to allow the erasure step, as taught by Okada, in a driving method similar to that which is taught by Mihara, in order to reduce flickers in the display device.

Further, it would have been obvious to include the simultaneous reset of Okada to the display of Mihara to reduce the amount of scan time required. For example, if the reset period is $T1$ in Mihara, the total time is $T1 \times \text{Number of scan lines}$. By providing simultaneous reset as taught by Okada the amount of time to display a frame (frame with two sub-frame) is reduced by $2 \times [(T1 \times \text{No. of scan lines}) - T1]$, which is a significant reduction in time to display an image frame.

Further, as to simultaneously resetting the scan lines after the scan lines are displayed, it would have been obvious to one skilled in the art to simply move the reset period from the start of the sub-frame as shown in fig. 6 of Okada to the end of the sub-frame (for example move the reset period C1 to the end of the display period C2). This would have been obvious when Okada is combined with Mihara as shown in fig. 4 of Mihara because the scan lines are rescanned in the reverse direction and would

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therefore need to be reset before the display system scans from the bottom row to the top row (i.e., in fig. 4 of Mihara, after row S_n is scanned, the simultaneous reset would occur for all scan lines so the pixels are ready for information to be written during the second sub-frame, i.e., from S_n to S_1 (reverse order).

With reference to **claim 2**, Mihara teaches that the scanning direction is reversed for every field in interlaced scanning (see page 5, paragraph 33-page 6, paragraph 34, of computer translation).. It can be seen in Figure 6, that the first field (first section) scans lines S_1 - S_n successively and in the second field (second section) scans in a reverse direction from lines S_n - S_1 .

With reference to **claim 3**, Mihara specifically teaches that two write periods are provided for each scan line, wherein there are two writes for each scan line since there is a write in the first field when scanned from top to bottom, and a write in the second field when scanned from bottom to top for each scan line contained in a single frame.

As to **claim 4**, it is clear from the modification discussed above with respect to **claim 1**, wherein the simultaneous reset set at the end of each field or sub-frame would result in each scan line being reset twice. For example, Mihara in Fig. 4 shows a first field or sub-frame being scanned from top S_1 to bottom S_n which would be followed by a simultaneous reset as described above. The simultaneous reset allows for the scan lines to be written to once more. The second field or second sub-frame is ready to be

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written to and is scanned from bottom Sn to top S1 and is again followed by a simultaneous reset to allow for the next frame to be scanned. Therefore, the modification of made to Mihara by Okada would provide two reset periods (**claim 4**) as well as two write periods (**claim 3**) for each scan line.

With reference to **claim 8/1, 8/2, 8/3/2/1. 8/4/3/2/1**, Mihara teaches that the driving method is applicable to drive liquid crystal and it would be obvious to include an apparatus for carrying out the driving of the liquid crystal.

6. **Claims 7 and 9/7/1** are rejected under 35 U.S. C. 103(a) as being unpatentable over Mihara in view of Okada as applied to **claim 1** above, further in view of Surguy (U.S. Patent No. 5,233,338).

With reference to **claim 7**, Mihara and Okada teach all that is required as explained above with reference to claim 1, however fail to teach that the display device successively displays data corresponding to three colors.

Surguy teaches a color sequential liquid crystal display wherein pixel elements are addressed to produce red, green and blue outputs in a display period (see column 4, lines 20-26).

Therefore it would have been obvious to combine the color outputs, as taught by Surguy, in a device similar to that, which is taught by Mihara and Okada in order to provide less flickers in a full color display device.

With reference to **claim 9/7/1**, Mihara teaches that the driving method is applicable to a drive liquid crystal display device (see abstract).

7. **Claims 10, 11, 12/10, 12/11**, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (U.S. Patent No. 6,172,662)

With respect to **claims 10 and 11**, Ito et al. teaches a liquid crystal display apparatus, wherein a polarity inversion drive method as explained comprises a frame period (F), which is divided into a plurality of selection periods (t11-t41) within one frame, defining the field. The selection periods (t11-t41) are further divided into two periods ((s1, s2), (s3, s4)), defining a plurality of writes within one field in the scan line (x1). With reference to Figures 4 and 5, it can be seen that data is written a plurality of times (s1, s2) in the first field (t11) by the use of a predetermined signal voltage (V1).

Even though Ito et al. teaches in the embodiment described in Figures 4 and 5, data is written a plurality of times (s3, s4) in the second field (t21) by usage of a predetermined voltage with the same polarity as that in the first field (t11), it is also further taught that the reversal period is not limited to one frame and it is possible to reverse the polarity for one field at a time, several fields, or several frames at a time (see column 12, lines 60-68). This is also explained with reference to the eighth embodiment explained with reference to Figure 9 (see column 15, lines 51-54). In view of the teachings disclosing that it is possible to reverse the polarity for one field at a time, it would be possible for one frame (F) containing a plurality of fields (t11-t41) to have a reversal of polarity every field, which reads on the limitations of **claim 11**,

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wherein data is written a plurality of times by use of a signal voltage having a polarity which becomes alternately positive and negative a plurality of times during the one frame (F).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to allow for the polarity of the signals applied to the scanning lines to be reversed each field within the frame as suggested by Ito et al. as explained above in order to prevent uneven display caused by non-uniformity of liquid crystal cells and in order to extend the longevity of the liquid crystal panel.

With reference to **claims 12/10 and 12/11**, Ito et al. teaches that the scan lines are divided in to blocks (G1, G2), wherein the scan lines of the plurality of groups are scanned simultaneously (see Figure 4).

8. **Claims 13/12/10, 13/92/11, 15/13/12/10, and 15/13/12/11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. as applied to **claims 12/10 and 12/11** above, and further in view of Surguy (U.S. Patent No. 5,233,338).

With reference to **claims 13/12/10 and 13/12/11**, Ito et al. fail to teach that the frame is divided into three fields corresponding to three colors and data is successively displayed within each field.

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Surguy teaches that a frame period (T_f) is divided into three subfields (t_i), each subfield for one of the three primary colors, red, green, and blue (see column 4, lines 20-23).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to allow for the frames to be divided in to groups corresponding to three colors, as taught by Surguy, in a display device similar to that which is taught by Ito et al. in order to provide a display with high quality color and a reduction of flickers thereby reducing unevenness and increasing the quality of the display.

With reference to **claims 15/13/12/10 and 15/13/12/11**, Inaba et al., Takabatake et al., and Surguy teaches a field-sequential liquid crystal color display apparatus in which data corresponding to three colors are successively displayed according to the driving method for a liquid crystal display as explained above (see column 5, lines 30-35).

Allowable Subject Matter

9. **Claims 5, 6, 8/5/3/2/1, and 9/6/5/3/2/1** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
10. **Claims 16-19** are allowed.

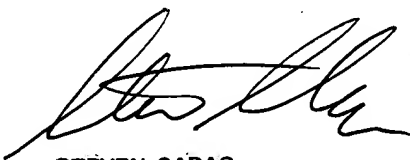
Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alecia D. Nelson whose telephone number is (703) 305-0143. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Saras can be reached on (703) 305-9720. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-2600.

adn/AND
January 15, 2004



STEVEN SARAS
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